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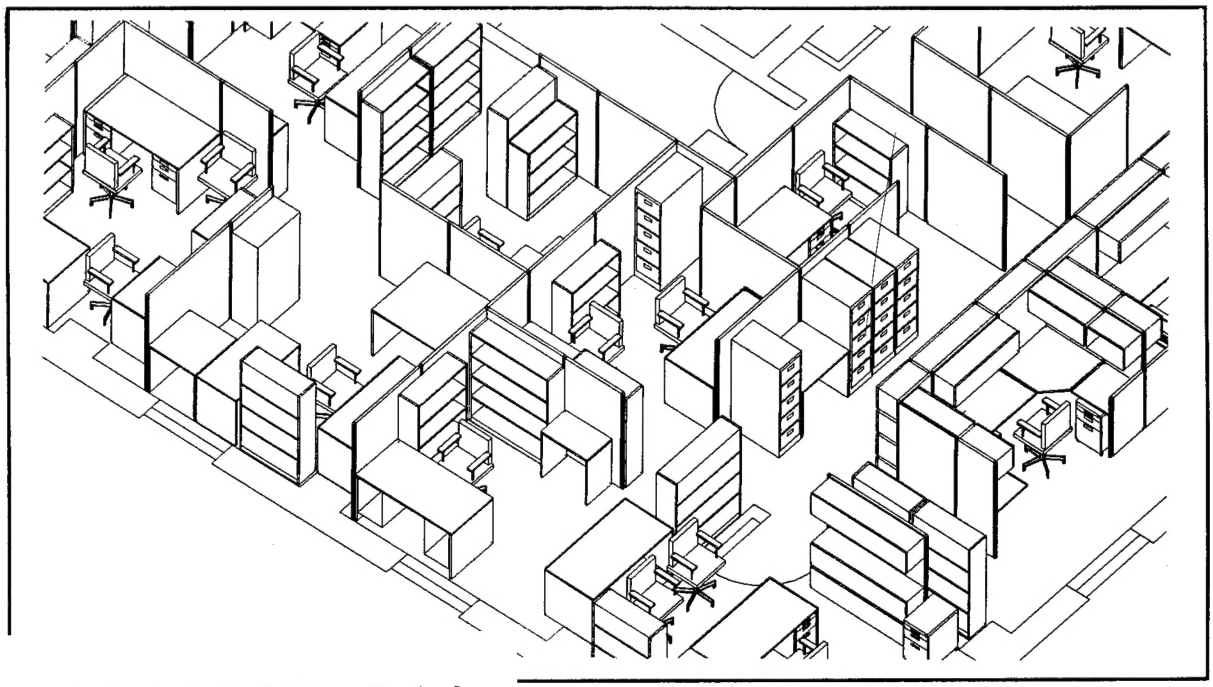
July 1994

Evaluating Office Environments: Overall Survey Results for the Corps of Engineers Albuquerque District

by

Simone Demirjian Beazly
Douglas C. Heinen



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Before designing a new facility, designers need to analyze the existing facility and its use. This research focuses on the facility of the U.S. Army Corps of Engineers, Albuquerque District and is based on a survey conducted in March 1994 to identify employee concerns and design issues that affect the "quality of life" for District employees. This report contains a summary of the survey results and design recommendations based on input from the entire District office.

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Before designing a new facility, designers need to analyze the existing facility and its use. This research focuses on the facility of the U.S. Army Corps of Engineers, Albuquerque District and is based on a survey conducted in March 1994 to identify employee concerns and design issues that affect the "quality of life" for District employees. This report contains a summary of the survey results and design recommendations based on input from the entire District office.

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Foreword

This study was conducted for U.S. Army Corps of Engineers, Albuquerque District under the Facilities Engineering Application Program (FEAP); Work Unit FF-FL4, "Office Evaluation Survey Instrument." The technical monitor was Kim Zahm, CESWA-ED-T.

The work was performed by the Facility Management Division (FF) of the Infrastructure Laboratory (FL), U.S. Army Construction Engineering Research Laboratories (USACERL). Alan Moore is Chief, CECER-FF, and Dr. David M. Joncich is Acting Chief, CECER-FL. The assistance of USACERL employees Douglas Boesen, Victoria McCleary, Jennifer Wetzel, and Todd Pardon is greatly appreciated.

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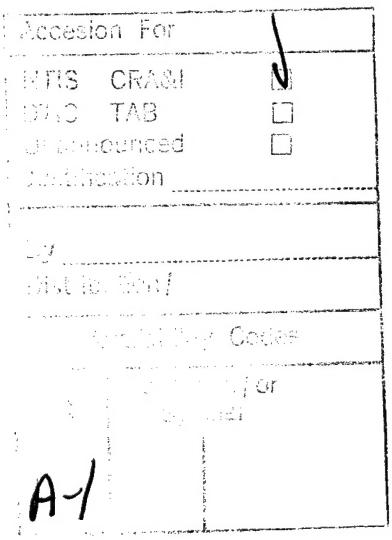

Introduction

Background

Before designing a new facility, designers need to analyze the existing facility and its use. This research focuses on design issues that affect the "quality of life" for the employees of the U.S. Army Corps of Engineers, Albuquerque District. It concentrates on the facility as a whole, and is based on the data generated from the "Evaluating Office Environments Survey" administered in March 1994 by the U.S. Army Construction Engineering Research Laboratories (USACERL). Supporting reports are being compiled to illustrate specific division/branch/section responses to the survey.

Objective

The objectives of this research were to define employees' concerns and design issues that need to be taken into account when designing a new facility at the U.S. Army Corps of Engineers, Albuquerque District, and to offer design recommendations to address the concerns and issues.

Order of Presentation

This report is presented in two sections. The first section, **Conclusions and Recommendations**, summarizes the Survey results and presents detailed suggestions on improving the quality of life in the new facility. The second section, **Data**, is a technical analysis of the Survey results. Graphical data is presented and evaluated based on previous USACERL studies* and user comments found in the Survey.

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* Heinen, Douglas C., Simone N. Demirjian, Todd A. Pardon, Blessing F. Adeoye, James R. Anderson, and Susan Weidemann, Technical Report (TR) FF-94/20, *The Value of Interior Design, A Description of the Benefits of Applying Interior Design Principles to U.S. Army Facilities* (U.S. Army Construction Engineering Research Laboratories [USACERL] May, 1994); Anderson, James R., Sue Weidemann, Douglas C. Heinen, Blessing F. Adeoye, and Simone Demirjian Beazly, TR FF-94/22, *Evaluating Office Environments: A Case Study* (USACERL, May 1994).

Points of Contact

USACERL: Ms. Simone Demirjian Beazly (217)352-6511, ext. 7357
Mr. Douglas C. Heinen (217)373-6716

CESWA: Mr. Kim Zahm (505)766-2613

Conclusions and Recommendations

The information in this report is from the data obtained specifically from the Albuquerque District employees. It should be used for the design of individual workspaces as well as overall building design. This first section contains summary issues that the professional research staff at USACERL determined by analyzing the data. The recommendations are specific issues that should be part of the users' functional requirements.

Workstation Activities

The Survey concluded that the majority of an employee's time is spent at his/her workstation, working the computer, with slightly more time spent reading and writing than in conversation. A significant amount of time is lost during the day due to interruptions and distractions. Survey results indicate this affects the amount of work done (typically, workers are caught up on work only 50 percent of the time). Improvement efforts should concentrate on increasing worker efficiency at the workstation and adapting the workplace to the computer. The following paragraphs suggest areas of improvement.

- Increase Workstation Efficiency

  - Worksurfaces

    Worksurfaces are used in a variety of ways (reference tables, layout areas, writing surfaces, etc.), and must accommodate a wide range of paper sizes. At least one worksurface should have a minimum 30-inch depth (preferably 36-inch) to accommodate large drawings. Arrange the worksurfaces using an L- or U-shaped layout for easy reach (Figure 1). Worksurfaces should have 36 inches between them for conventional front-to-back

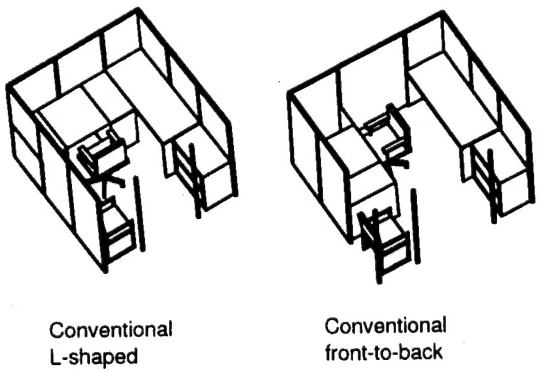

Figure 1. Workstation layouts.

arrangements. They should also be 30 to 34 inches in height if a keyboard drawer is being used. If no keyboard tray is used, maintain a height of 29 inches.

- Panel Arrangement
  Panel arrangement can be used to increase privacy by staggering openings to workstations located across from each other. The use of 65-inch high partitions as a minimum is also recommended to increase acoustic/visual privacy. Higher panels (72 to 80 inches) can be used to better delineate zones, branches, or sections. Where visual, not acoustic, contact is needed, the use of partitions with glass inserts is recommended. These partitions can be outfitted with adjustable blinds to provide privacy. Panels should be arranged so the workstation opening is in the center of a wall. This will facilitate U-shaped workstation arrangements (putting everything within arm's reach), and increase panel stability, especially when using panel-hung overhead storage. To help eliminate unwanted distractions, entry to workstations should not occur along major or well traveled corridors.

- Storage
  Currently, many sections have files located within individual workstations. Joint use of these files is a main source of interruption/distraction. For these sections, centralized group filing areas should be provided.

  Use of panel-hung storage components (storage bins, in-out boxes, paper sorters, etc.) will increase the usable floor and worksurface area in individual workstations . Tackable panels or boards help eliminate desktop clutter. Low (two-drawer) filing cabinets can also be used as worksurfaces.

■ Adapting the Workplace to the Computer

The survey showed much time is spent on the computer (over 60 percent of the workday). Therefore, workstations should be widely adaptable (use adjustable chairs, keyboard drawers, adjustable lighting, etc.) to the individual user. This will help eliminate fatigue and increase worker efficiency.

- Worksurfaces
  Worksurfaces should be deep enough to accommodate a computer monitor, with a viewing distance and height such that the user does

not have to bend his/her neck, or squint. Larger monitors will require greater viewing distances (around 24 inches for a 17-inch monitor). Monitors may be located at a 45 degree angle in the corner of the workstation to accommodate the narrower worksurface depths. CPUs can be located directly under the monitor or elsewhere under the worksurface to accommodate different monitor viewing heights. Worksurfaces should be directly adjacent to the monitor (use an L- or U-shaped layout) and be of ample dimensions for reference materials (large drawings, documents, etc.). Adjustable ergonomically sensitive keyboard trays are highly recommended; however, if the keyboard is located on the worksurface, increase the worksurface depth.

- Panel Arrangement
  A minimum 65-inch high panel is recommended, so that computer monitors can fit under panel-hung storage units. Pre-wired panels and panels with raceways are recommended to accommodate multiple cabling. Typically, four to five workstations are run on a single circuit, and the panels' power strips can accommodate up to three different circuits. Power poles can be located in the center of a workstation, and cabling run in either direction from that point.

- Storage
  Panel-mounted overhead storage needs to be high enough to provide clear space for monitors. Typically, a 17-inch monitor requires 21 inches of clear space. Storage bins are taller than shelving units due to the door on the unit. Because of this, shelving units allow more vertical space above the worksurface. Panel-hung storage units provide easy access to reference items, and use the work station's wall space. With the ability to close the door on storage bins, usually clutter can be minimized in each workstation.

Lighting

The Survey indicated overall building light levels were, for the most part, sufficient. Occasionally individuals were bothered by the amount of light, or glare from fixtures located directly overhead. The most favorable lighting comments came from those who were in control of both their ambient and task lights. Areas of concern are as follows:

- Use of Natural Light

  - Preference

    As anticipated, natural light is preferred by everyone. Even when a nearby window caused glare, workers would rather cope with glare than not have access to natural light. The design should focus on bringing more natural light to all, without sacrificing privacy. One way to increase natural light is to pull all of the workstations away from the window. In this way, everyone gets a window. Another way to deal with this problem is to provide glass panels/windows in the workstations located along the exterior. Natural light can then penetrate into the interior building space. Adjustable blinds on the glass panels can provide privacy to individual workstations when needed or can reduce glare.

  - Glare

    Glare from natural light sources was sometimes a problem, and depended on the time of day and location of the computer monitor. Relocating the monitor will solve this problem, but may involve rewiring workstations. Some other solutions include providing adjustable blinds on windows, providing a hood over the monitor, and/or providing a filter on the screen. The latter two recommendations will also help reduce glare from ambient light sources.

- Ambient Light

  - Glare

    Ambient light levels generally were adequate, especially for conversing. However, ambient light levels were slightly too bright for using a computer, and glare on the computer monitor was a problem. Glare may be simply and inexpensively solved by providing a diffusing lens or a fine eggcrate diffuser over the fixture. Either method can sufficiently diffuse light for computer use, unless a workstation one is located directly under the fixture. As mentioned, glare on computer monitors can also be eliminated or reduced by providing a hood over the monitor or a filter on the screen.

  - Shadows

    Shadows created on worksurfaces from storage bins or people was a minor problem that was often solved at the individual level by putting task lighting under storage bins. Employees with task lighting were most satisfied with lighting in the facility. Lowering ambient light

levels and increasing task lighting over worksurfaces may increase overall satisfaction and reduce energy and operating costs.

- Task Lighting

  - Location of Fixtures
    Users provided with task lighting had the highest satisfaction level. This again makes a strong argument for lowering ambient light levels and increasing task lighting. Task lighting should be provided under storage bins located above worksurfaces.

Temperature and Air Quality

Temperature is a major problem in the work environment. In some areas it fluctuated drastically, in other areas it was extremely cold, and in other parts of the building it was extremely hot. Those that were most satisfied with temperature commented their area was not as bad as other locations.

Occupants are more satisfied with air quality than temperature. The largest problems were with stale, dusty air. Stuffiness, also a problem, may be partially attributed to high heat levels. There were relatively few health problems that could be attributed to the building's mechanical system. The following items need special attention because they may affect temperature and/or air quality in office environments.

- Interior Partitions

  - Height
    Partition height can drastically affect the facility's overall temperature, air circulation, and air quality. Higher partitions inhibit air flow, and enclosed offices must be individually supplied. The recommended partition height of 65 inches provides the best balance between heating, ventilating, and air conditioning (HVAC) efficiency; privacy; and vertical storage capability.

  - Location
    Partition proximity to supply/return ducts affects the building climate. When air supply/return is lowered (i.e., along window walls), partitions should be shorter and set away from the duct so as to not impede air flow. Often, individuals are affected (too cold, too hot) if their kneespace is located near an air supply duct. In this instance,

low panels should be provided between the individual and the air supply duct.

- Windows

  - Control
    Direct light can cause worksurfaces to become too hot. Adjustable blinds will provide additional control for individuals. Air quality can also be controlled with operable windows.

Acoustics

Acoustics was identified as the largest problem area in the existing facility. Acoustical privacy was important, not because of confidentiality, but because high noise levels made it extremely difficult to do business over the telephone and do work that required high levels of concentration (analysis, calculations, etc.). Noise from air ducts and others talking is almost constant. The following are suggestions in improving the acoustical performance of the facility.

- Partitions

  - Height
    Sound can be controlled by varying partition heights, with full floor to ceiling partitions being the most effective in controlling acoustics. However, there are several problems with providing full height partitions throughout a facility (HVAC control, spatial flexibility, reconstruction costs), and therefore partial height partitions are generally more efficient from a facility management standpoint. It is recommended that 65-inch high partitions be used extensively throughout the facility, with taller (80-inch) partitions used when additional vertical storage space or visual screening is required. Experience has shown the height difference (between 65- and 80-inch partitions) is not significantly effective in controlling sound transference.

  - Insulation
    Sound control insulation can be specified in the partitions. It is less effective in movable panels, than when installed in drywall partition walls, but experience has shown individuals can perceive a difference. (Note that there is a difference between sound insulation and thermal insulation, so be sure what is being installed is what was specified.)

- Ceilings
  - Transmission Control
    The majority of noise transmission occurs through the ceiling. Therefore, specifying an acoustical ceiling tile with a high sound transmission class (STC) rating will improve the facility's overall acoustical performance through sound absorption. Acoustical performance can also be improved by laying sound insulation above the ceiling tiles. This option needs to be coordinated with cabling and HVAC systems, especially if the space is being used as a plenum.

- Floor Covering
  - Carpeting
    Acoustical performance can also be improved by using sound absorbing material such as carpeting instead of vinyl-coated tile (VCT) or other hard surfaces. Floor coverings in high traffic areas should be stain resistant carpet. If access to the floor is needed, specify carpet tiles.

- Space Planning
  - Group Areas
    The Survey indicated acoustical problems were caused when group areas (copy machines, plotters, files, break areas, printers, etc.) were located adjacent to workstations. When these areas were moved away from workstations, satisfaction levels increased. This may be why there is a low preference for break areas to be located near workstations. It is recommended that group areas be provided for printers, copy machines, etc., and they be located away from entrances to workstations.

  - Workstation Arrangements
    Acoustical privacy can be enhanced through workstation arrangement. Eliminating workstation entrances from main corridors, using partitions to separate sections/branches, and varying partition heights all help diffuse noise and improve the acoustic quality of the facility. Voice mail also helps eliminate phone noise due to unanswered phones.

Worker Satisfaction

The Survey indicated rather high satisfaction levels for the overall quality of life in the Albuquerque District. This is substantiated by the overall high Self and Co-worker ratings. Workers were most dissatisfied with the amount of space, the arrangement of their workspace, and their workstation. It is also interesting to note that individuals with more control over elements of their workstation had higher overall satisfaction levels. The new environment must concentrate on increasing satisfaction levels.

- Workstation Characteristics

Design efforts should manipulate the perception of space, making it appear larger and increasing its quality. This can be done as follows:

- Appearance
  Survey results indicated the overall appearance of the facility could be improved. Improvements can be made by changing the color scheme and updating furnishings. Selecting a light overall color scheme with accent colors will make the space appear larger. Options for updating furnishings include:

  - Refurbishing existing furniture: electrostatically painting metal desks, files, panels, reupholstering existing chairs, and panels,
  - Purchasing "new" refurbished furniture, or
  - Purchasing new furniture.

- Size
  The amount of space provided in individual workstations had the lowest overall satisfaction levels. Some of this may be due to poor furniture arrangement, clutter, etc. Eliminating long corridors, or breaking up the corridors with the use of color/patterns will make a space appear larger.

  Increasing the amount of usable floor space through the use of vertical components (panel-mounted storage bins) will also increase space. The location of the workstation's entry opening also plays a role in usable floor area — a centralized entry point will allow U-shaped furniture arrangements, and generally will allow more linear feet of worksurface. Shared files should be moved out of the workstation and put into group storage areas, again increasing usable space.

Taller panels (80-inch) will make a space appear smaller, therefore 65-inch high partitions are recommended. Glass partitions can also be used to "open" space, by allowing natural light and a "view," both in and out of the workstation.

- Privacy
  Lack of acoustical and visual privacy lowered satisfaction ratings. (See previous discussions on how to increase overall privacy levels in the new facility.)

■ Workstation Control

The Survey indicated that user control played a key role in satisfaction ratings. Control was more important at the workstation level than at the overall facility level. The following are some suggestions for increasing user control:

- Arrangement
  The ability to arrange one's space to operate more efficiently can drastically increase worker efficiency. Some workers operate more efficiently with a front to back arrangement, while others operate better with a front to side arrangement. It is recommended that workstations be set up to allow the user to place his/her materials in a variety of configurations. Task lighting provided should allow the worksurface to be lit, not the computer monitor. Accessories such as tackboards and marker boards should be specified for easy relocation. Mobile pedestals give the user control over arrangement, although the pedestals have high initial costs.

- Adjustability
  The Survey also showed employees have a high preference for adjustability. Those who could control the location of light were the most satisfied with lighting. There was also a High Frequency of Occurrence with adjustability at the workstation level. If employees could adjust it, they did. Therefore, products specified in the workstation should provide a high level of adjustability; for example, adjustable task lighting, chairs, keyboard drawers, etc.

Data

Survey data obtained from the users was grouped into the following categories, and compiled into a series of charts. These charts are located at the end of this report; explanations are found below.

Activities and Experiences

■ Chart 1: Workstation Activities

This chart shows workers spend the majority of their time (over 80%) at their workstations. The surveys indicate that supervisors and division chiefs spent considerably less time in their workstations than other employees. Of the amount of time spent in the workplace:

- The majority of the workday is spent working on the computer,
- There is an equal distribution of time spent reading and writing papers,
- Approximately one fourth of the workday is spent in either direct or telephone conversation.

■ Chart 2: Workstation Activities

This chart is significant because it indicates the amount of distraction in the workplace is extremely high; 35 to 40 percent of an average work week has some form of interruption or distraction. Furthermore, workers are caught up on work only 50 percent of the time in an average work week. Comments indicated work involves high levels of concentration, and this low rating may be due in part to high levels of distraction.

Lighting Conditions at the Workstation

■ Chart 3: Workstation Environment - Lighting Conditions

The most favorable reactions to light involved being able to control its intensity, amount, and direction. Chart 3 indicates overall lighting conditions and preferences for the existing facility. It specifically shows:

- Glare is sometimes a problem. It occurs most often when an overhead light is improperly located. Certain areas of the facility also experienced glare problems from overhead light fixtures being in the wrong position or when workstations were located near windows.

- Fluorescent lights are slightly more preferable than incandescent light.

- There is an extremely high preference for windows. Those experiencing glare from windows indicated they would rather deal with glare than not have a window. Those that did not have windows indicated a desire for them.

- Workers working in their shadow was an occasional problem. Comments indicated that workers could control this deficiency when task lights were provided.

■ Chart 4: Workstation Environment - Lighting Conditions

Lighting is one of the more successful aspects of the current facility. Overall light levels generally appear to be adequate for most tasks, although certain areas of the building have light levels that are too bright. Light levels for conversing appear almost ideal. The most variation occurred between the tasks of reading a computer screen and writing/reading. In most cases, light was slightly bright for reading the computer screen, and slightly dim for writing/reading documents. This is of interest because often these tasks occur simultaneously, and could be a reason why control of individual light elements ranked so highly.

Temperature and Related Conditions at the Workstation

■ Chart 5: Specific Temperature Conditions

This chart shows employees' perception of temperature and is rather deceptive. It rates temperature conditions near satisfactory. But according to comments, and further verified in later charts, achieving satisfactory temperature conditions was the second largest problem facing the current facility. Comments indicated the facility experienced severe temperature problems that varied depending on workstation location. As a result, the overall perception of temperature appears to be "just right."

■ Chart 6: Workstation Temperature Conditions

This chart shows frequent temperature problems at the workstations. Workstations located directly by windows had problems with the sun making worksurfaces too hot. Two major problems were temperature stability and unpredictability. About 40 percent of the comments referred to unstable (unsatisfactory) temperature conditions, and 50 percent of the comments reported the temperature as rarely satisfactory. This high dissatisfaction level further questions the validity of Chart 5.

Workstation Air Quality

■ Chart 7: Workstation Air Quality

This chart indicates how noticeable common air toxins are. Tobacco smoke is relatively infrequent, mostly due to the facility's nonsmoking policy. Comments concerning tobacco smoke were directed to designated smoking areas (cafeteria). Unpleasant odors are somewhat more frequent, and consist of cooking and burned popcorn. Dust is the largest problem, but is still relatively infrequent.

■ Chart 8: Winter/Summer Air Quality

Chart 8 shows how air quality is perceived during the winter and summer. Most problems occur during the summer, when air is perceived as stale. Air is also perceived as somewhat stuffy and dry during the summer. During the winter, this dryness increases, while the staleness of the air slightly decreases. Stuffiness also decreases during the winter, almost approaching the "just right" condition. Overall, air quality ratings are favorable in the existing facility.

Workstation Acoustics

■ Chart 9: Workstation Acoustics

The survey indicated that acoustics is the main area of concern in the existing facility. The two largest sources of noise are from air ducts and other people talking. This noise posed severe problems for people while they were on the phone or trying to concentrate on their work. This may be a source of lowering productivity, as some work (calculations or analysis) require high levels of concentration. Another source of acoustical disturbance was noise from typewriters/printers. This problem was typically solved by moving the equipment to a remote location. Other forms of acoustical

disturbance (hum from light fixtures, office copiers, mechanical equipment) were less frequent. Overall, the facility is perceived as rather noisy.

Workstation Characteristics

■ Chart 10: Workstation Control

As mentioned, worker satisfaction levels were highest when they were given control over elements of their workplace. Chart 10 shows how the worker evaluated his/her ability to control certain elements of their workstation. Results show overall very low levels of control, especially with temperature, ventilation, and sound. This substantiates earlier findings that temperature and acoustics were areas that need improvement.

■ Chart 11: Workstation Spatial Characteristics

This chart helps pinpoint inadequate aspects of current workstation design. It indicates current workstations are limited in all areas, especially in terms of privacy and adjustable furnishings. There is typically too little space provided to perform various tasks. The amount of writing space provided comes closest to approaching ideal. This may be because computers are heavily used, and the amount of space for writing is not as critical to overall performance.

■ Chart 12: General Workstation Perceptions

This chart verifies previous survey results. It shows deficiencies in workstation privacy levels, appearance, and spatial characteristics, and again indicates workstations are too public, and too cramped. Since the survey asked about perceived workstation characteristics, results can be altered through the use of interior design.

■ Chart 13: Perceptions of Workstation Characteristics

Chart 13 is another verification chart. The survey responses that resulted in this chart asked workers to evaluate certain perceived characteristics of their workstations and workplace. It validates the following:

- Workers are indifferent to current furniture arrangements, although many were concerned that new worksurfaces would have insufficient width for laying out drawings.
- Jobs often require high levels of concentration.
- High satisfaction level with co-workers.

- Positive perception of comfortable chairs and stable worksurfaces.

- Workstation appearance could be improved. This is the most negative aspect of workstation perception.

■ Chart 14: Workstation Behaviors

Chart 14 summarizes work habits so designs will actually relate to current work habits, and be adopted by workers. It shows that users tend to adjust parts of their workstation and furnishings (chair height/back, keyboard, computer screens, etc) more frequently than they adjust building components (thermostat, windows, etc.). This is supported by comments indicating occupants were less prone to make adjustments (turn off and on overhead lights) when it affected co-workers. Low levels of adjustment may also result from limitations discussed in Chart 11, and may be an indication that there are fewer problems with these aspects of the workstation.

■ Chart 15: For Your Job

This chart is primarily used for programming and space planning. It shows responses to questions regarding both work habits and overall building conditions in order to optimize workflow. Related survey questions asked about what type of access (e.g., visual, acoustic) to co-workers is required and about control of the workspace (e.g., lighting, ventilation). Chart 15 also verifies previous survey results. For example, questions about acoustics are rated most important, further supporting the facility's low acoustical performance ratings.

■ Chart 16: Physical Work Experiences:

Productivity levels can be affected by the amount of time lost from worker absenteeism/sick leave. Chart 16 pinpoints areas of concern by asking users about health related issues. Overall, very little productivity is lost due to health-related issues. Nasal congestion and eye irritation are the most predominant factors, but are still relatively infrequent occurrences.

■ Chart 17: Emotional Experiences

Like health related issues, stress and satisfaction can also affect productivity levels. Chart 17 is an indicator of stress and satisfaction levels of workers. It shows that stress indicators (being inadequately trained, being over-worked, being distracted by the phone, and being cramped/crowded) have very low ratings. Satisfaction indicators (feeling excited, feeling involved, feeling energetic) have much higher ratings. When combined, these two results act to boost productivity.

■ Chart 18: Doing the Work: Self Ratings

Charts 18 and 19 verify survey results and locate the strengths and weaknesses of the workforce. Chart 18 shows overall high self ratings. Frequency of Errors and Creativity have the lowest overall ratings (although they are still fairly high), and could be improved.

■ Chart 19: Doing the Work: Rating Co-Workers

Chart 19 is very similar to chart 18, indicating there are no real problems with the perception of the workforce. Overall coworker ratings are slightly lower than the overall self ratings in Chart 19, especially when ranking Responsibilities and Dependability. Comments were made that a "few bad ones spoil it for everyone," and this could account for the lower ratings.

Satisfaction

■ Chart 20: Satisfaction with Aspects of Your Work

Overall, satisfaction levels ranked fairly high. Extremely high satisfaction levels were given to:

- Co-workers.
- The freedom to make one's own decisions.
- Working in the Albuquerque District.
- The amount of supervision given.
- The quality of supervision.

Lowest satisfaction ratings indicated the employees were slightly dissatisfied with the amount of space they were given. They were also indifferent to the arrangement of their workspace and their workstation in general. Therefore, the greatest impact to quality of life can be made by modifying the built environment.

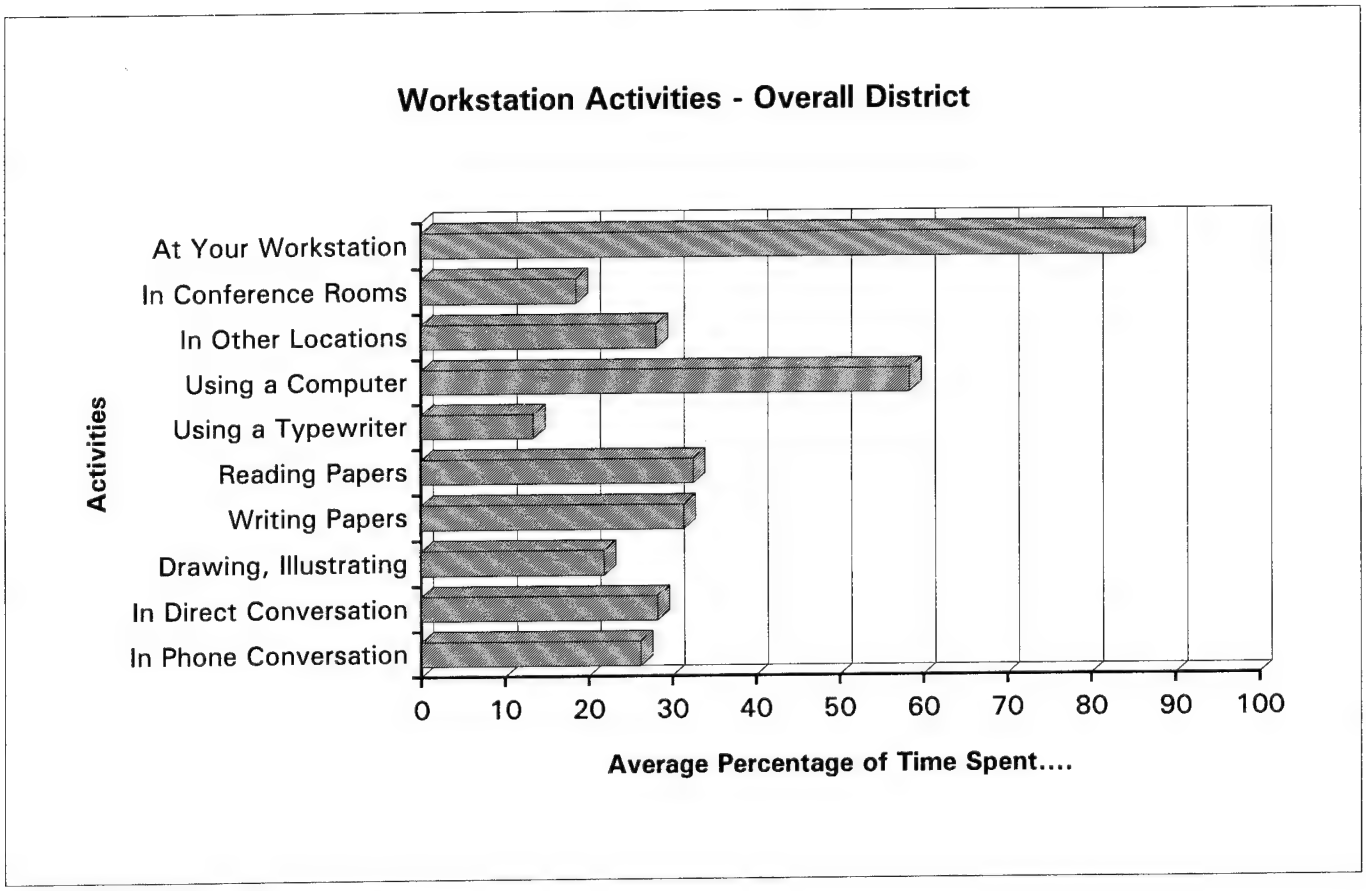

Chart 1: Workstation Activities

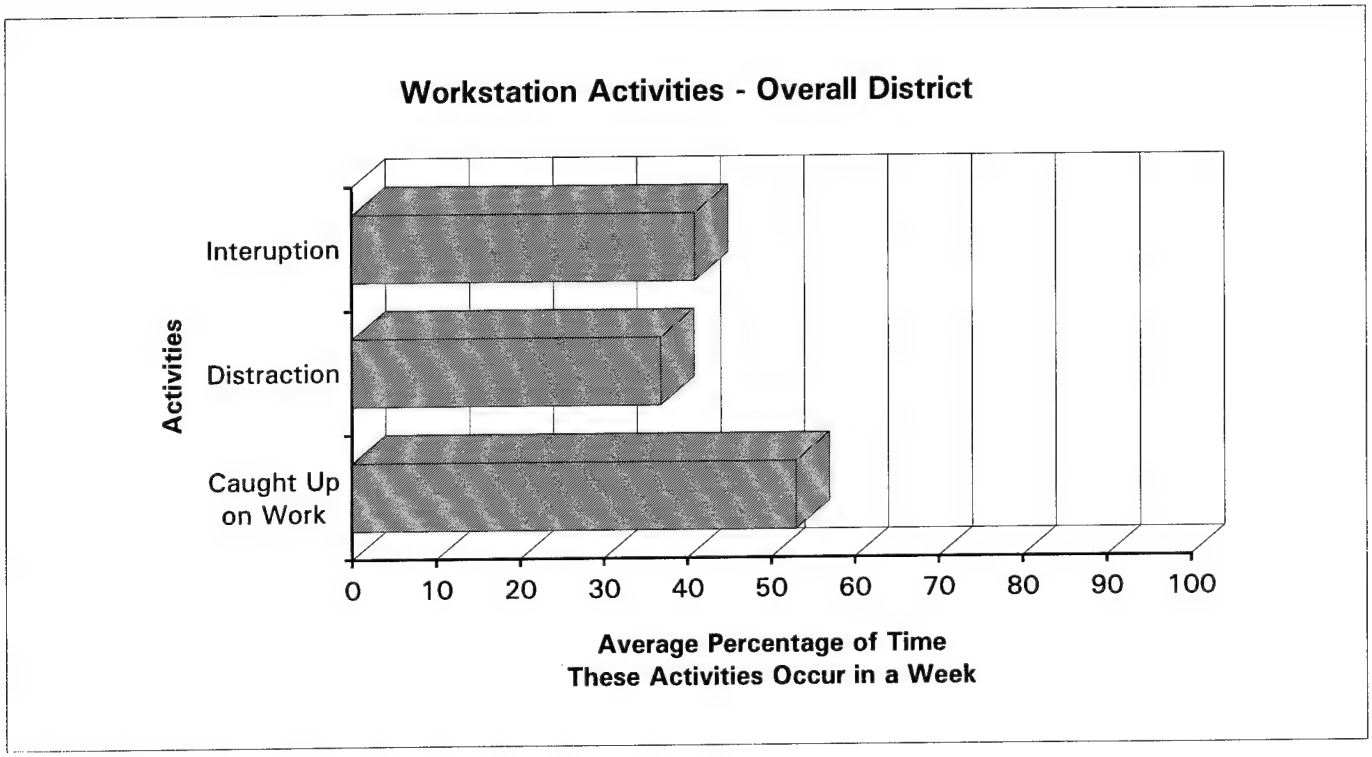

Chart 2: Workstation Activities

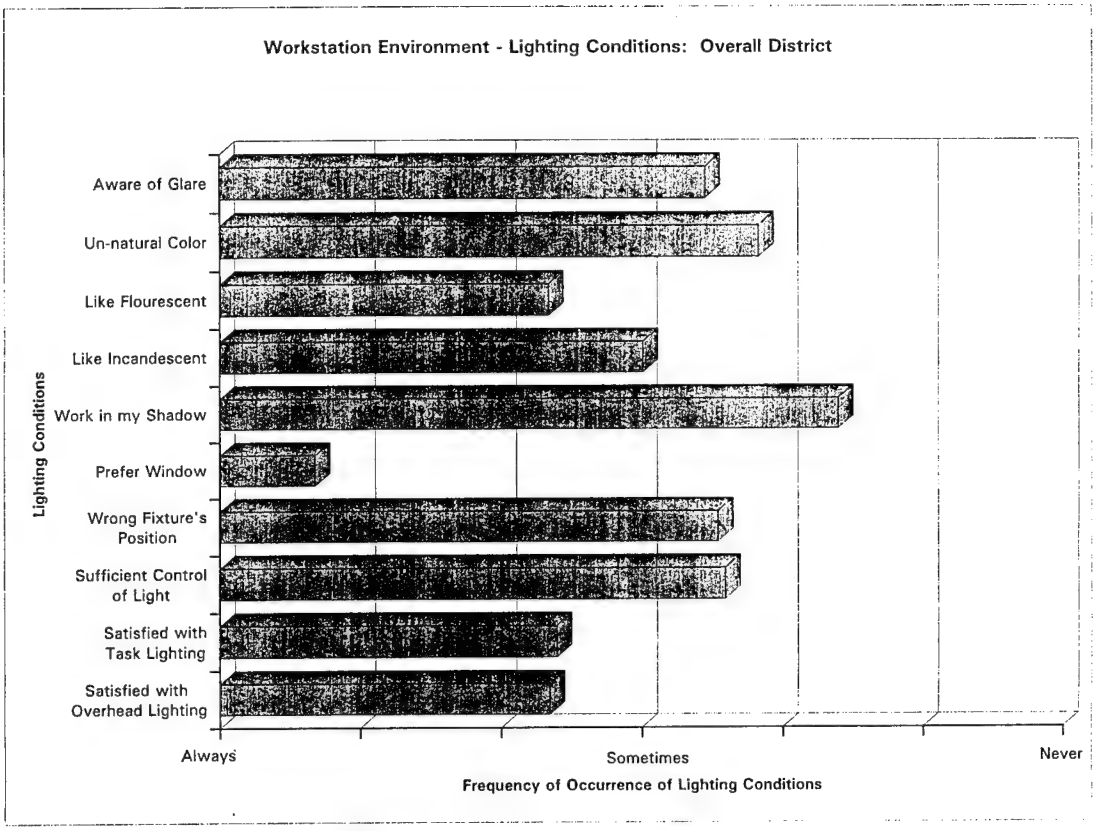

Chart 3: Workstation Environment - Lighting

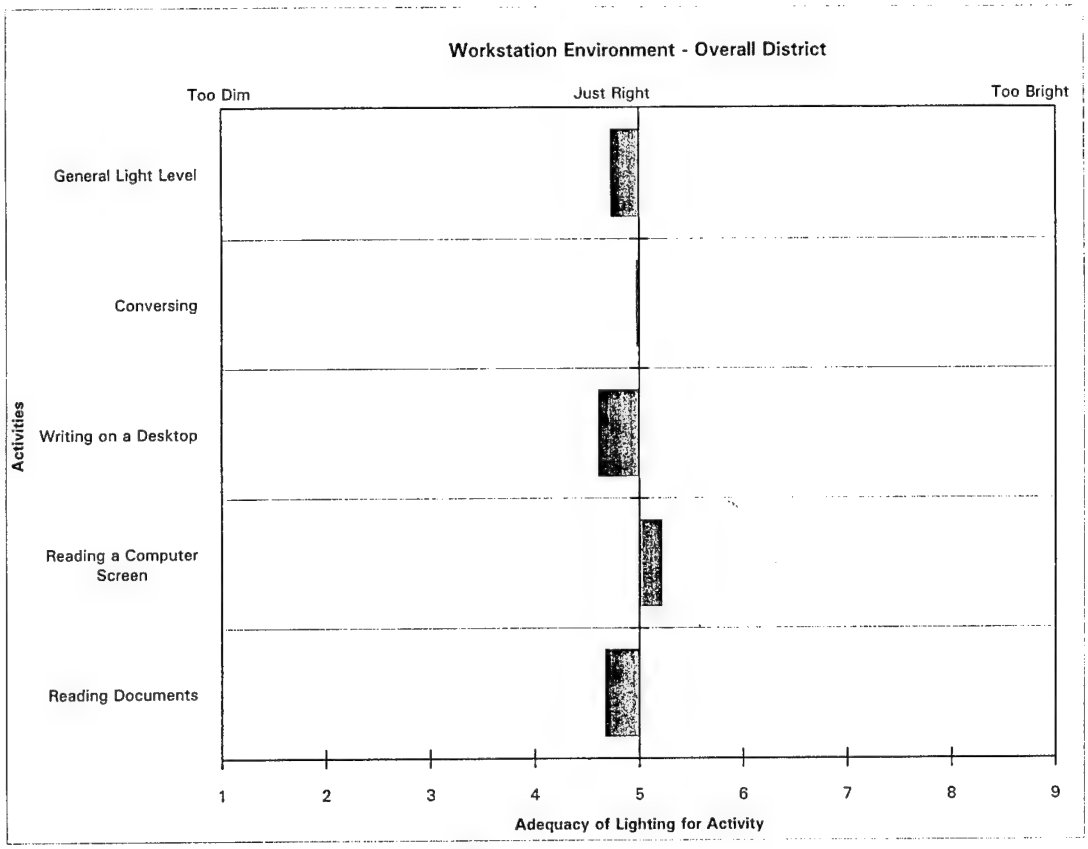

Chart 4: Workstation Environment - Lighting Conditions

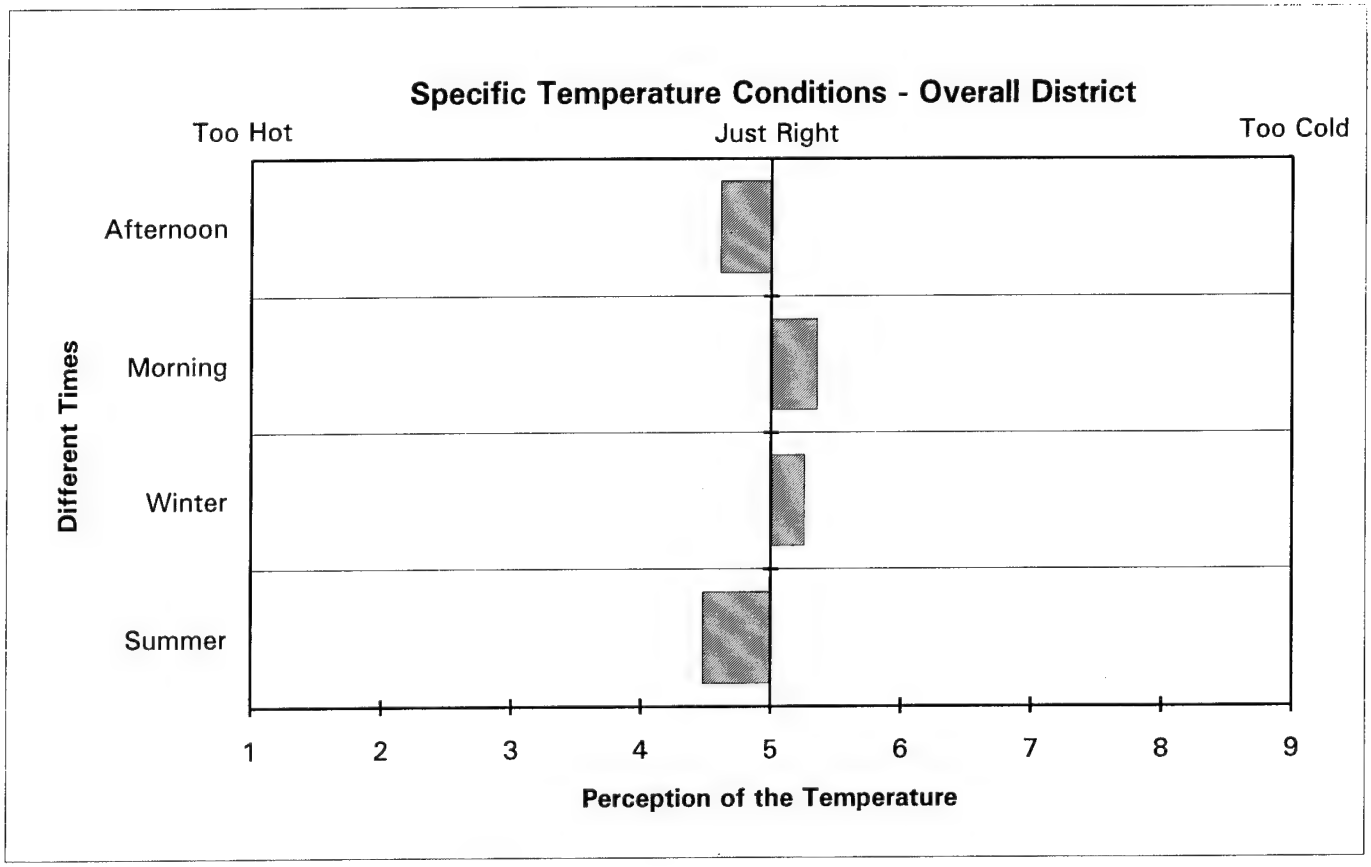

Chart 5: Specific Temperature Conditions

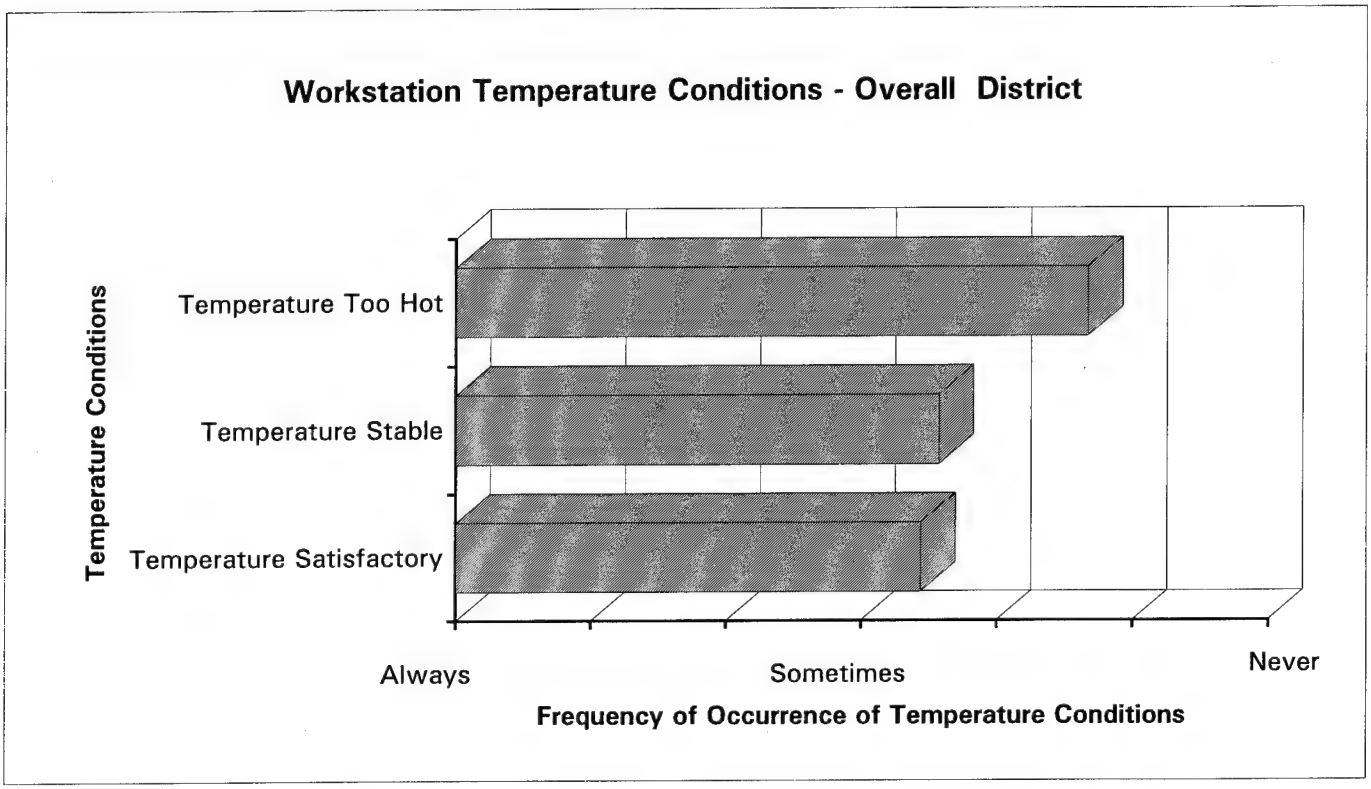

Chart 6: Workstation Temperature Conditions

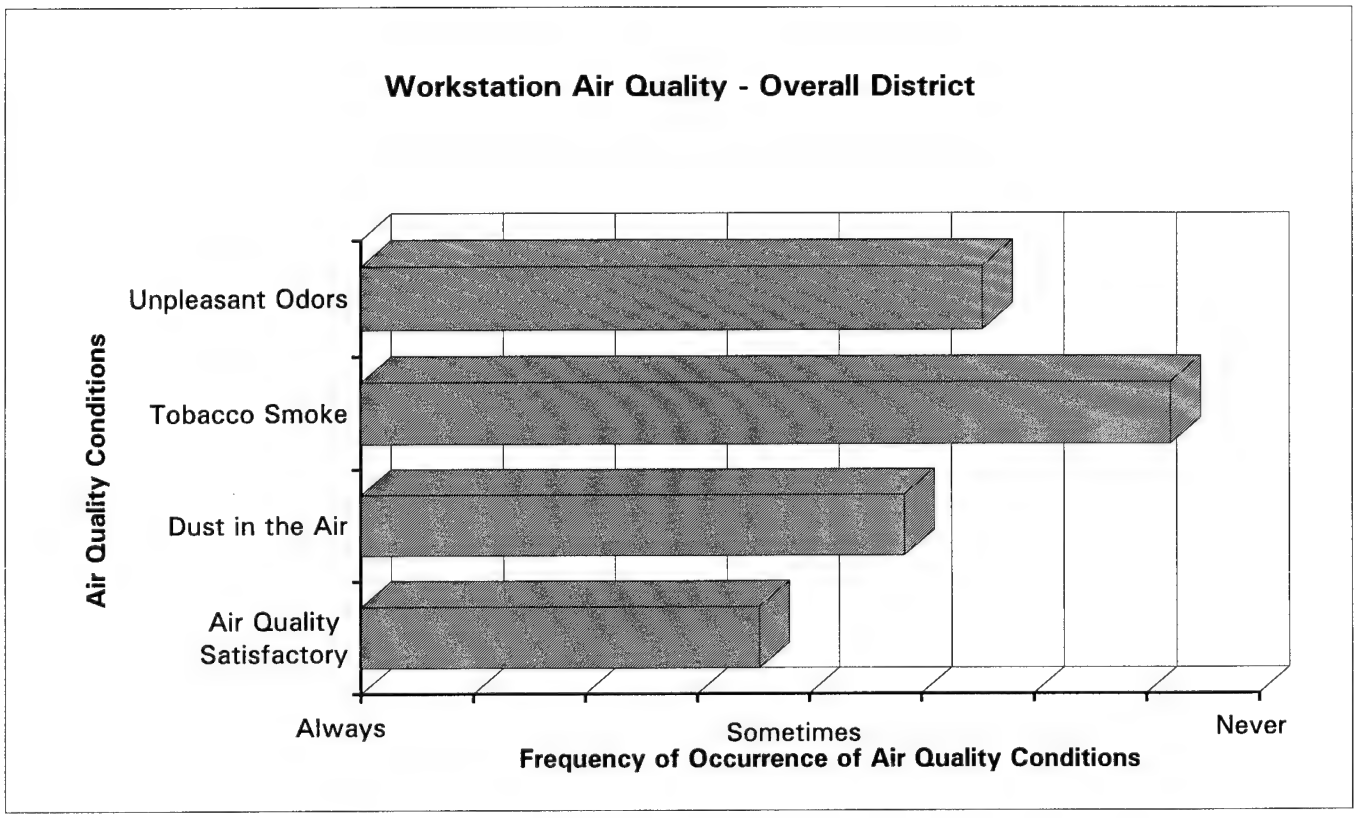

Chart 7: Workstation Air Quality

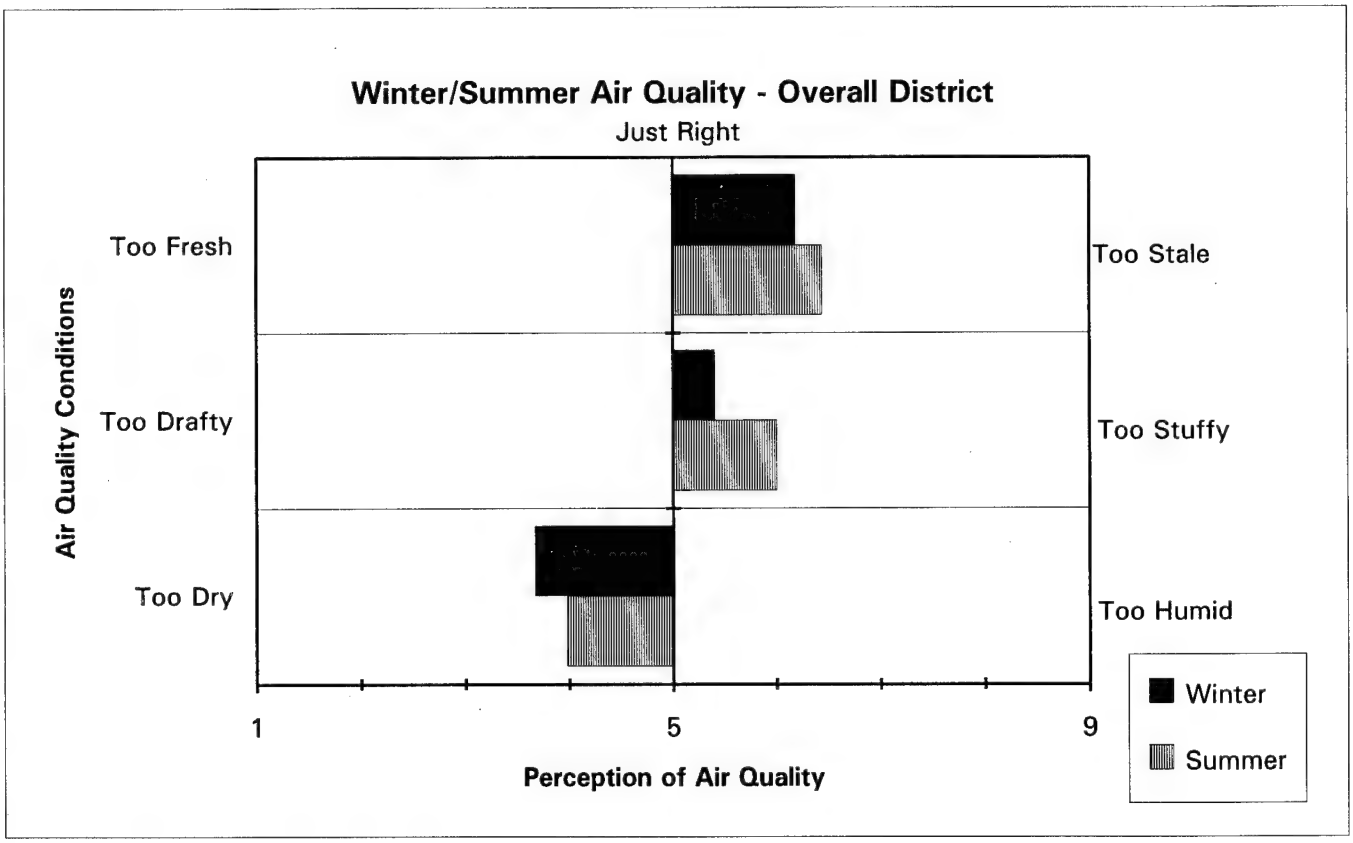

Chart 8: Winter/Summer Air Quality

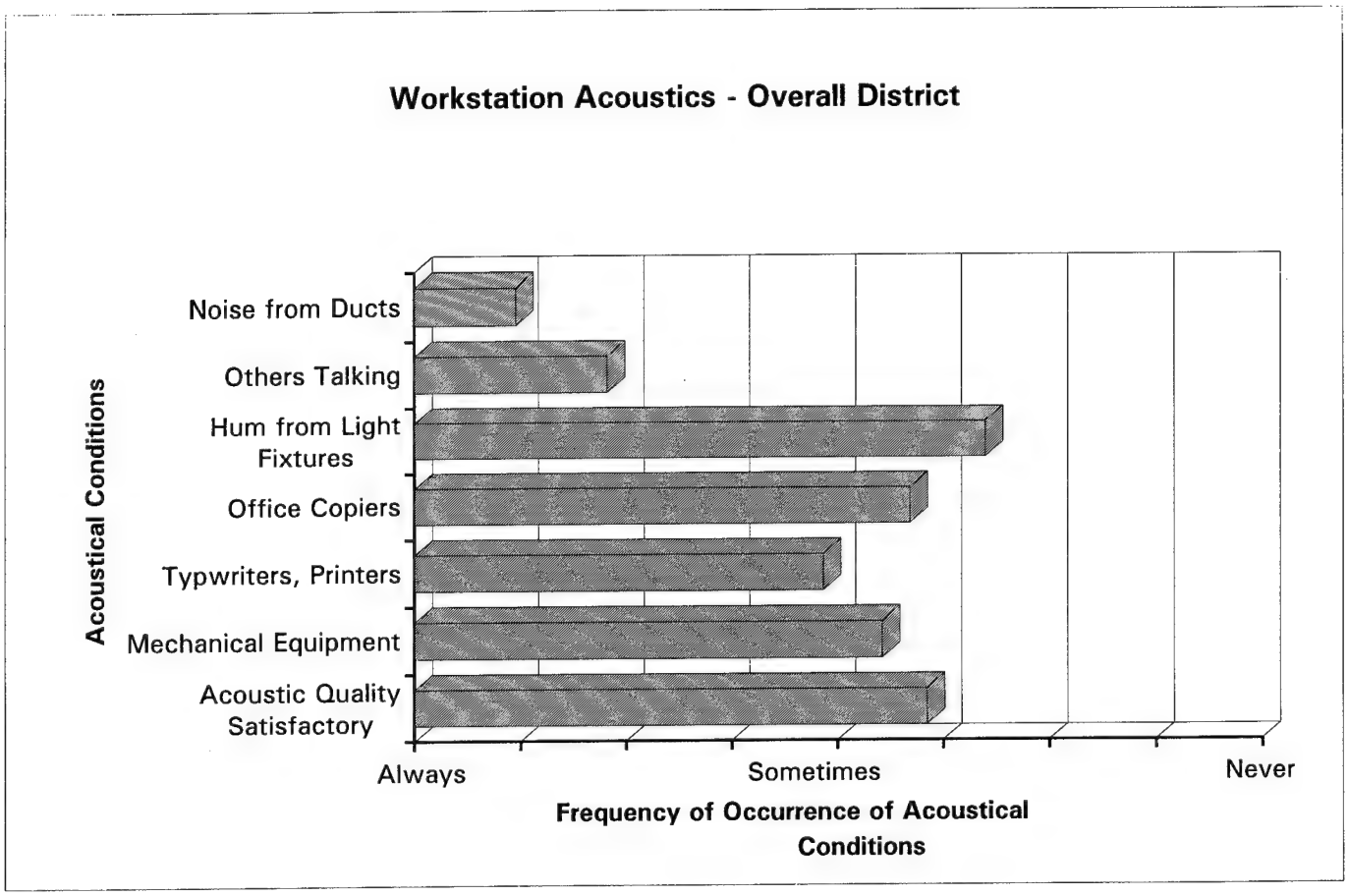

Chart 9: Workstation Acoustics

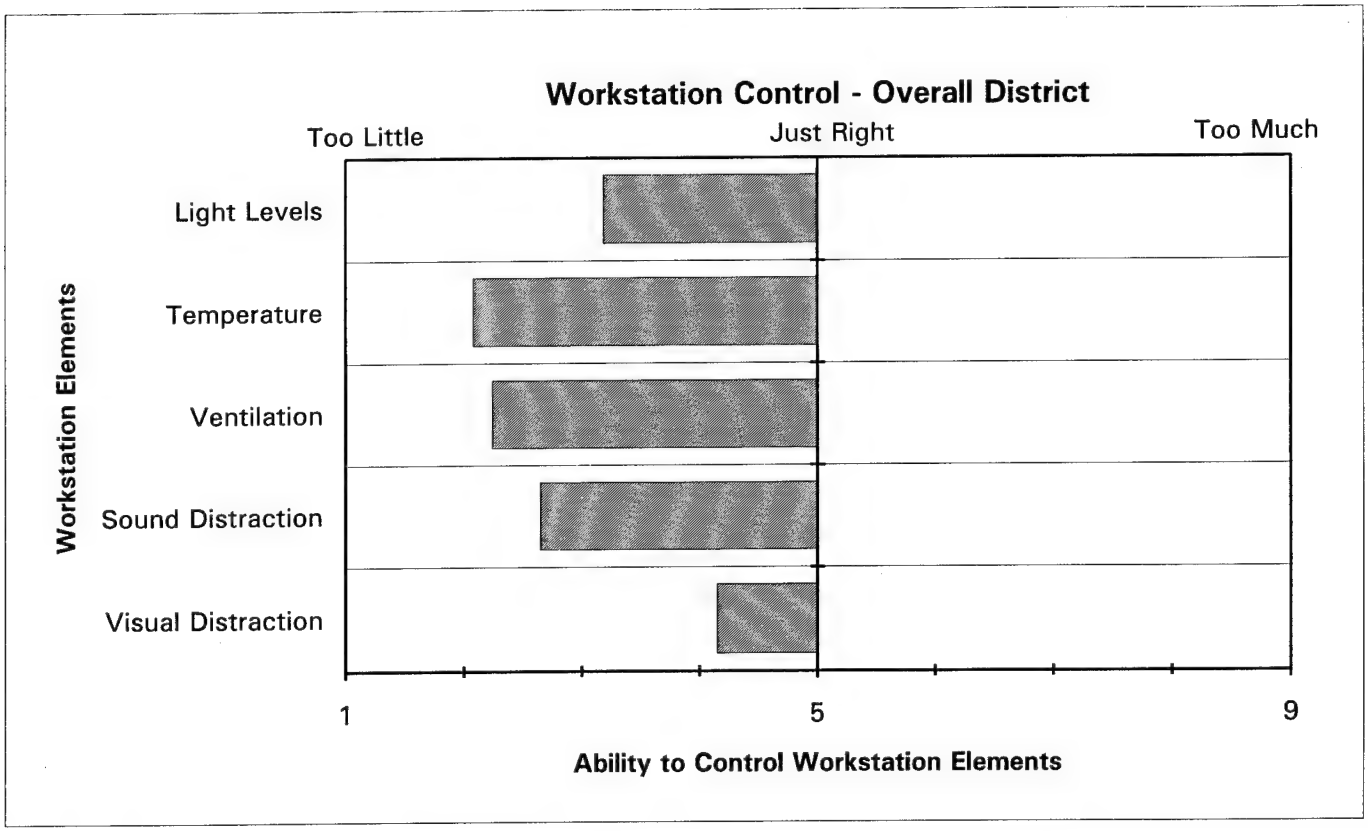

Chart 10: Workstation Control

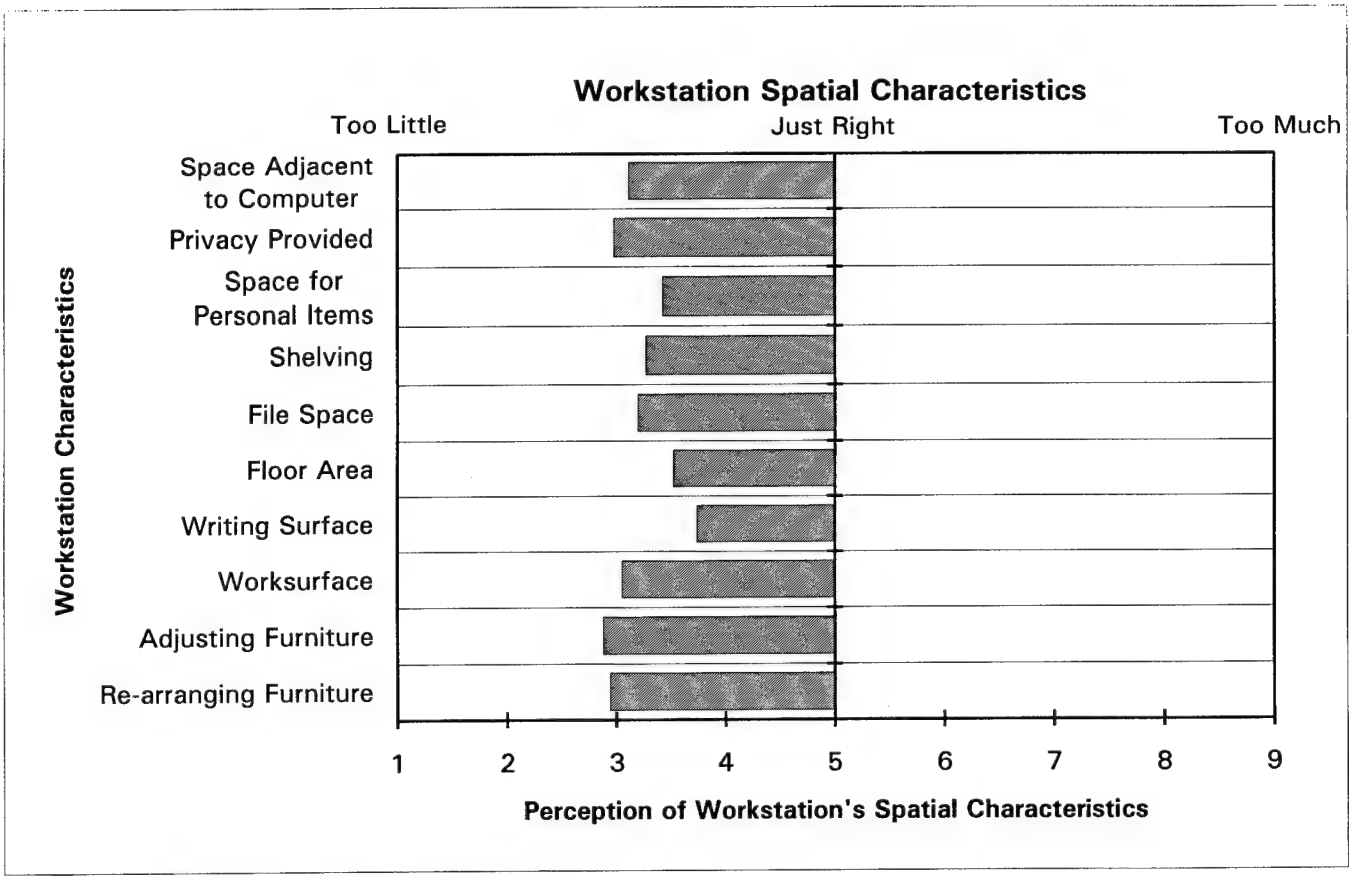

Chart 11: Workstation Spatial Characteristics

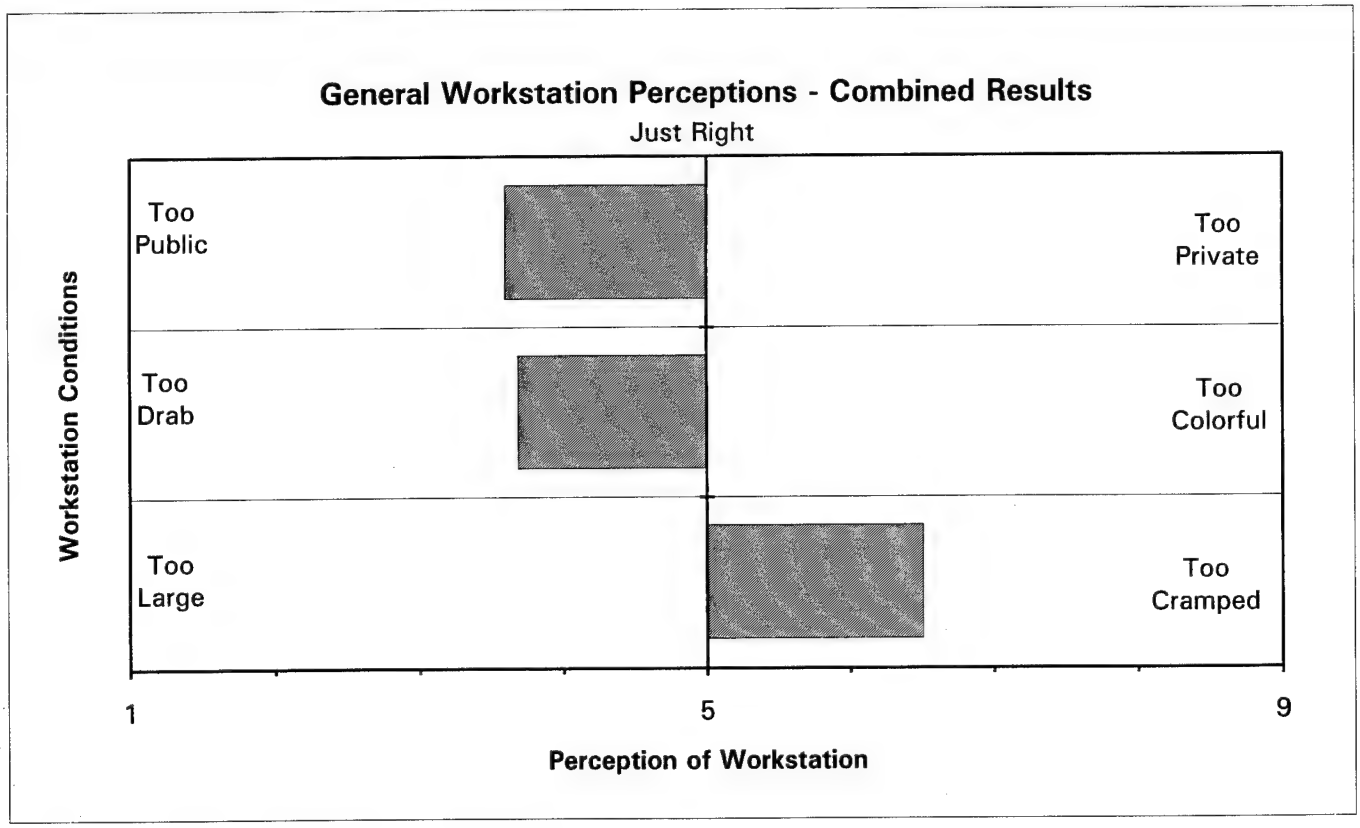

Chart 12: General Workstation Perceptions

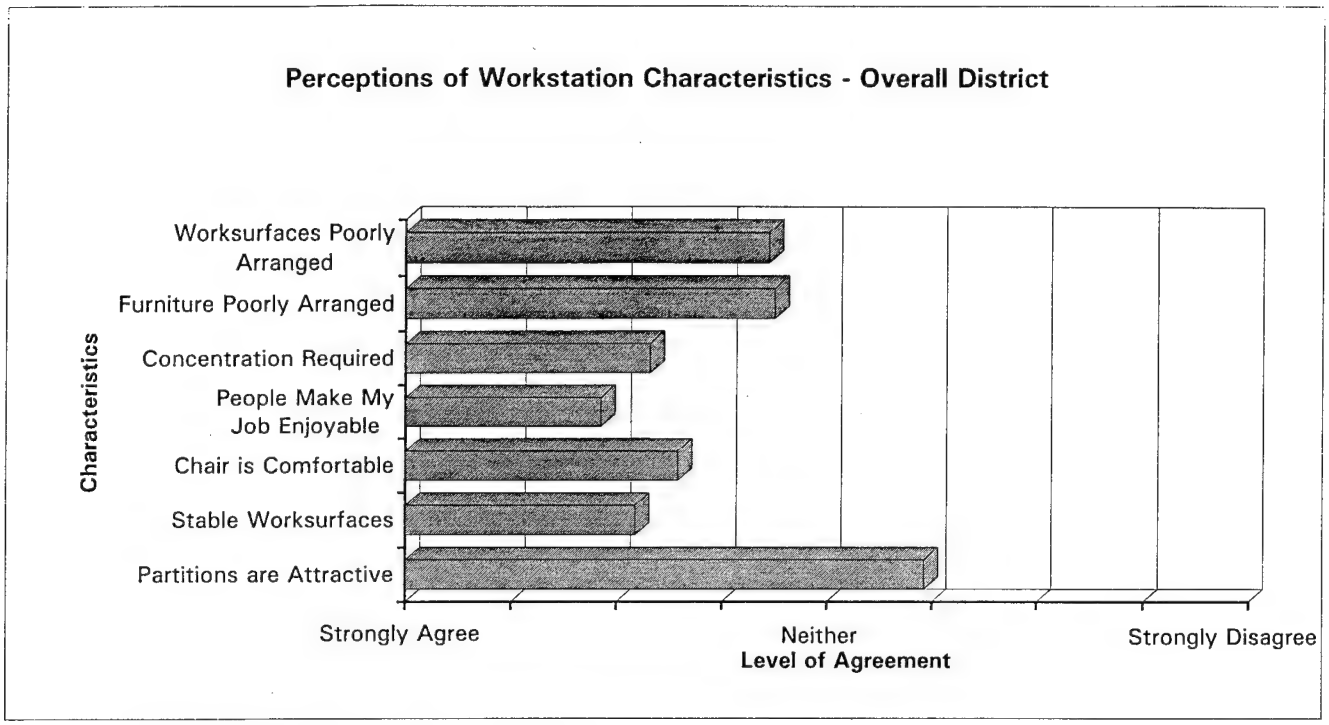

Chart 13: Perceptions of Workstation Characteristics

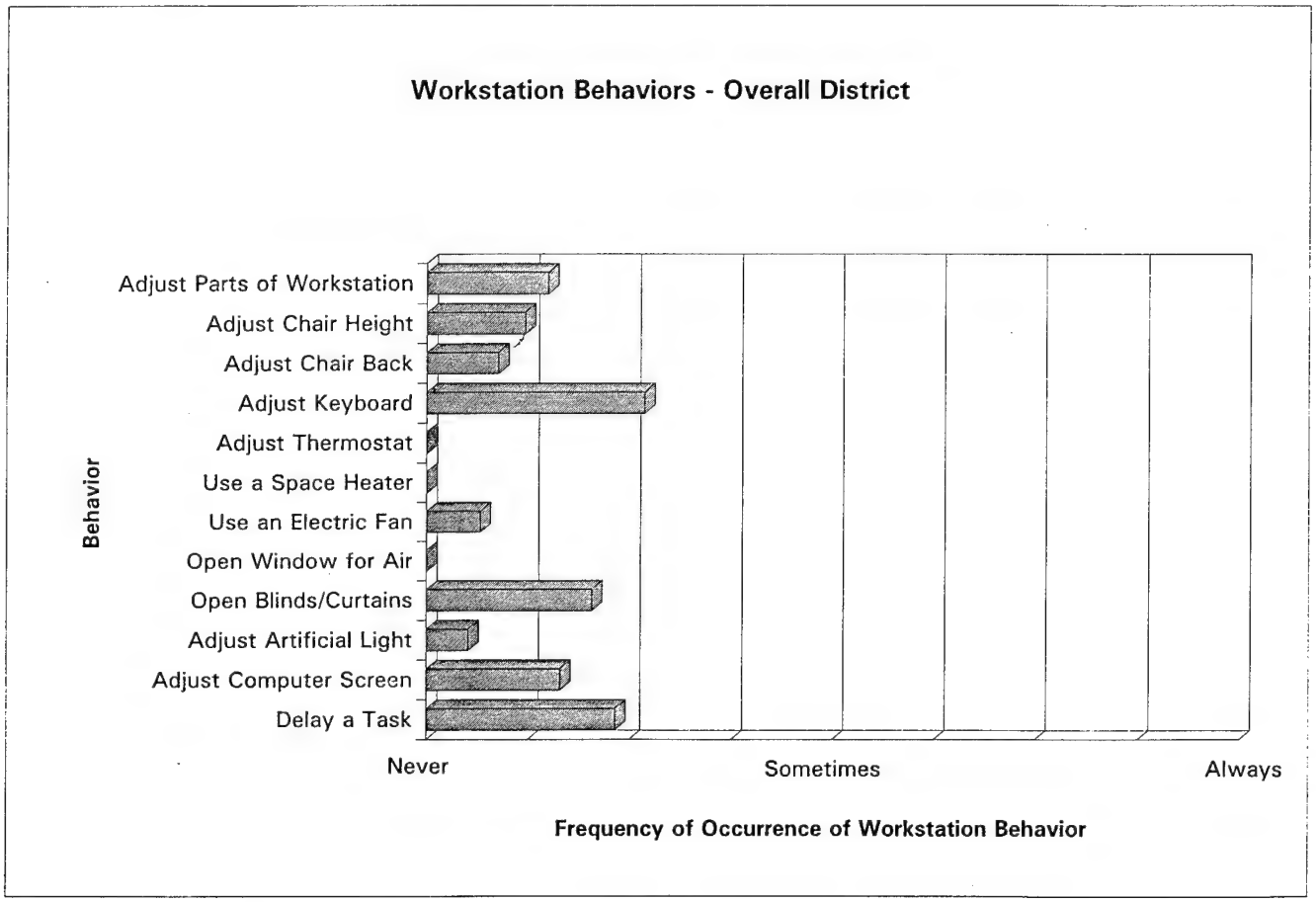

Chart 14: Workstation Behaviors

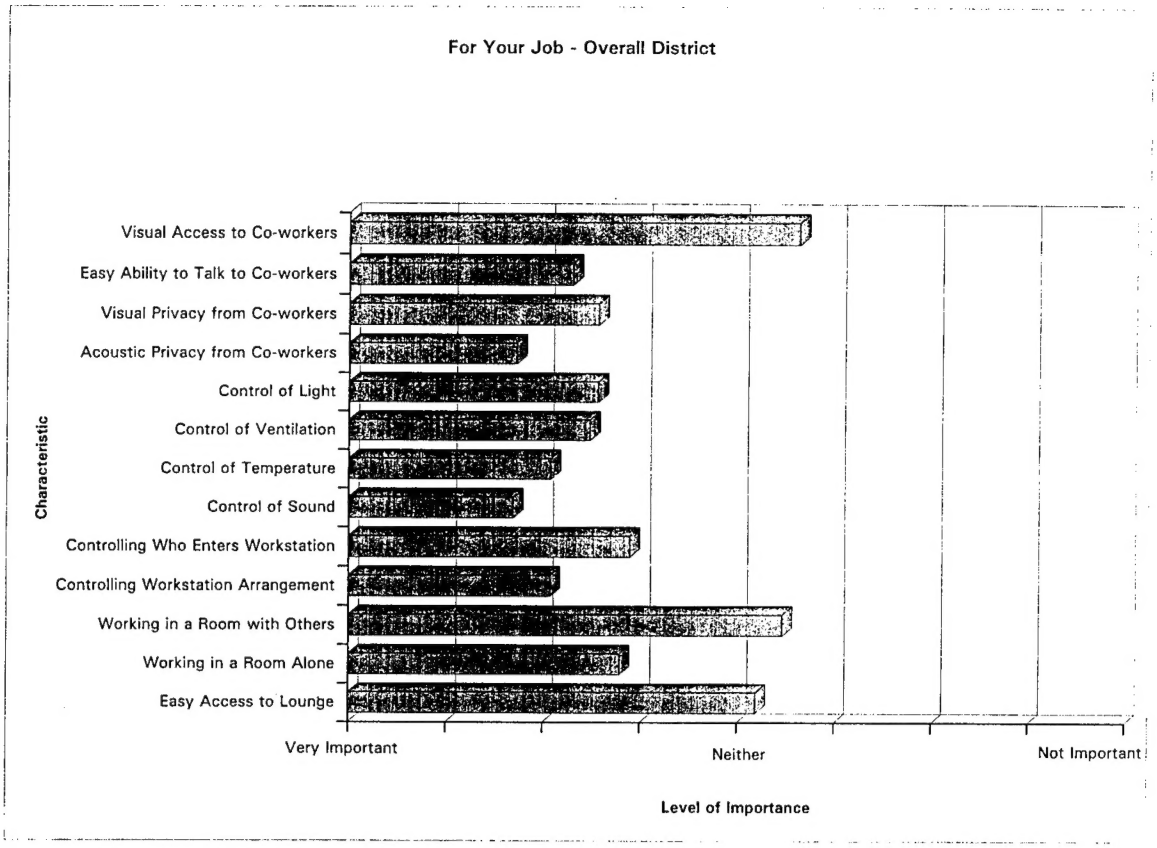

Chart 15: For Your Job

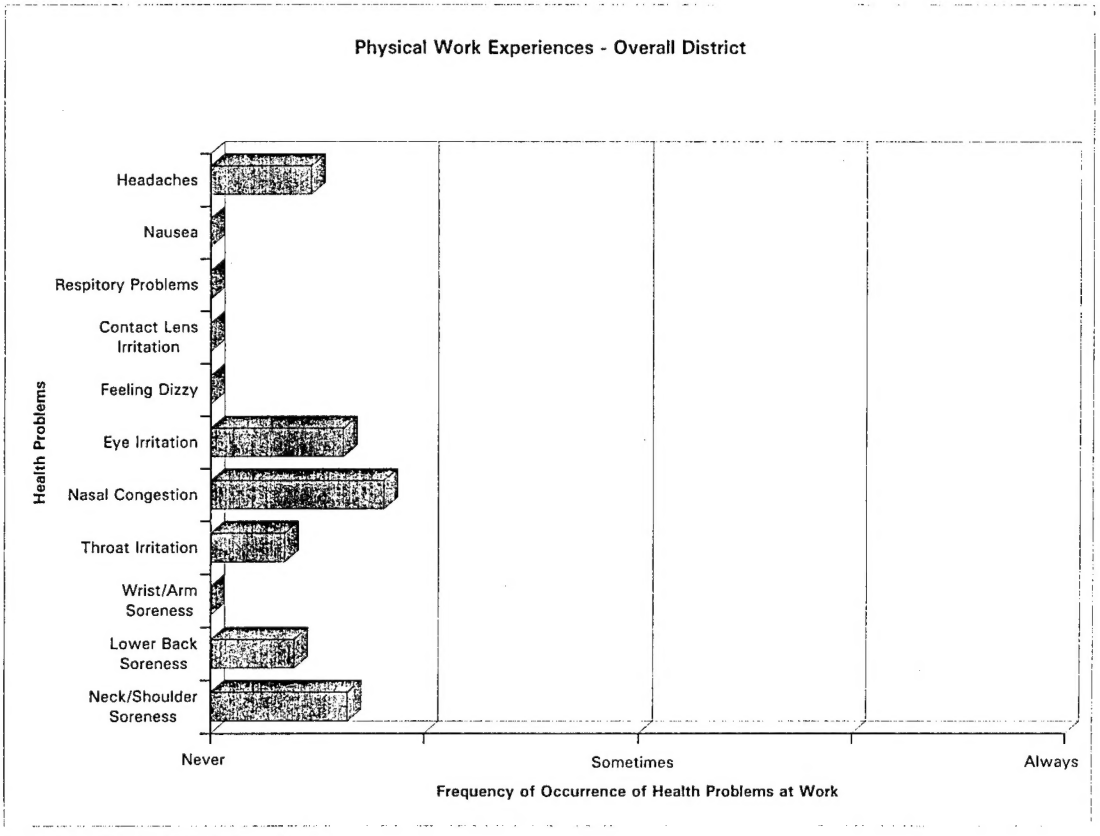

Chart 16: Physical Work Experiences

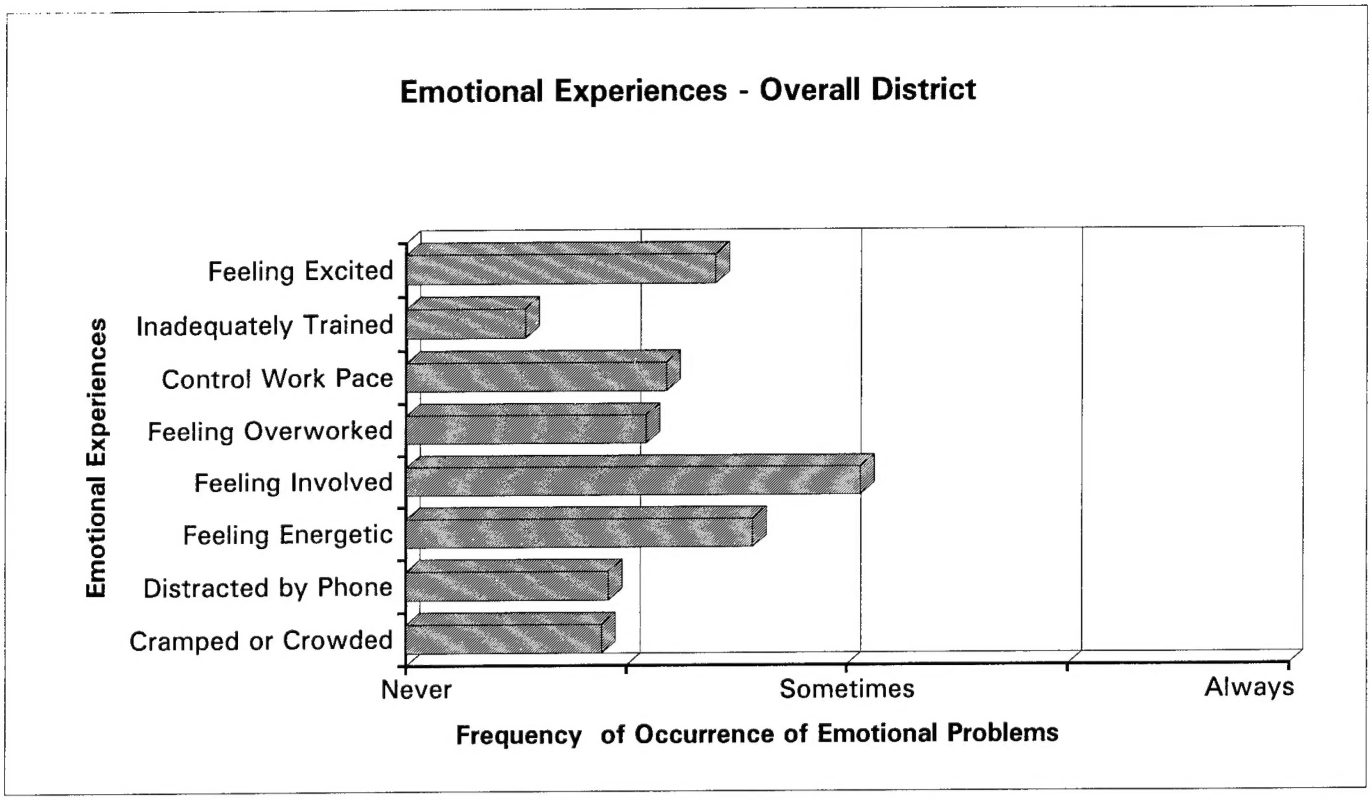

Chart 17: Emotional Experiences

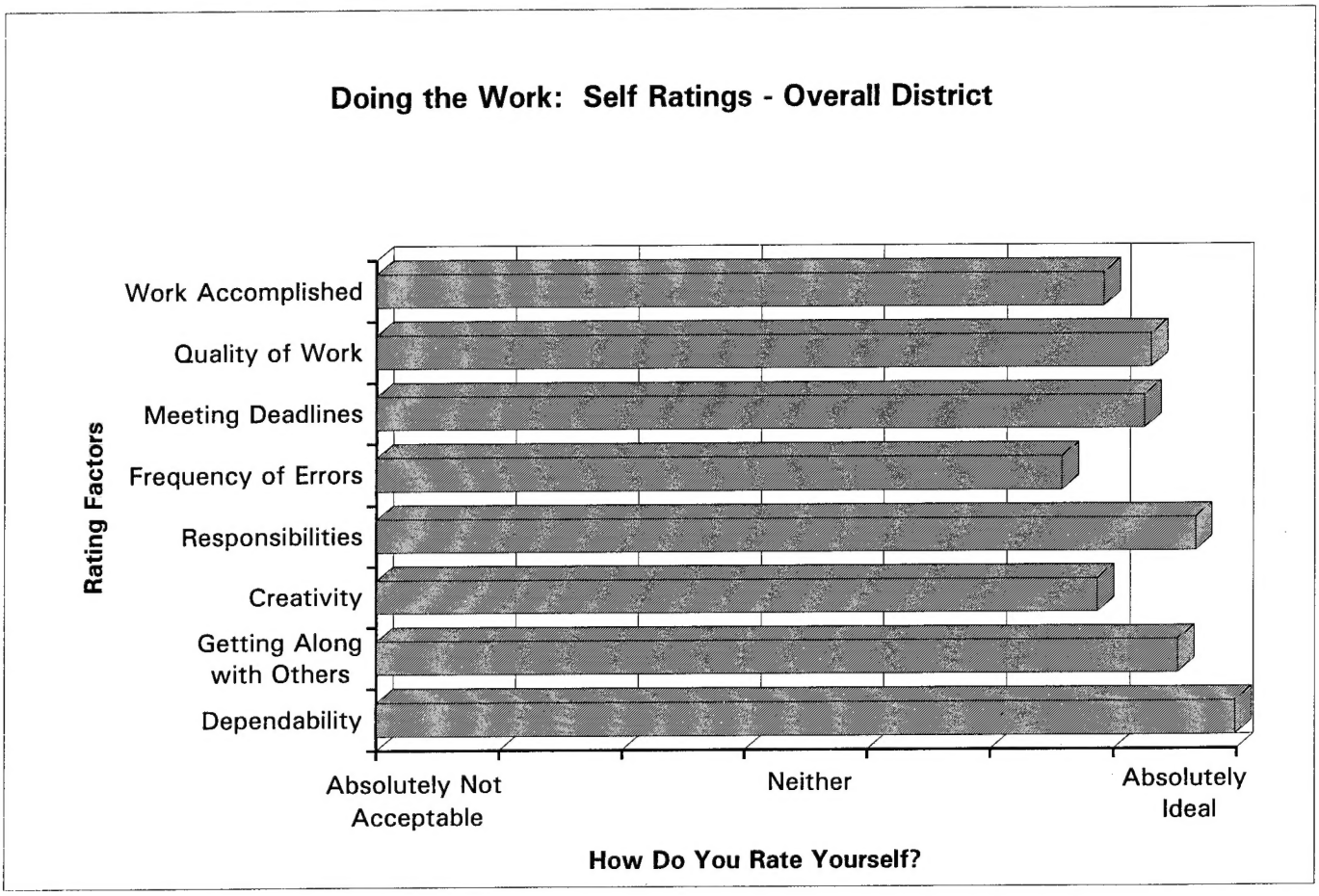

Chart 18: Doing the Work: Self Ratings

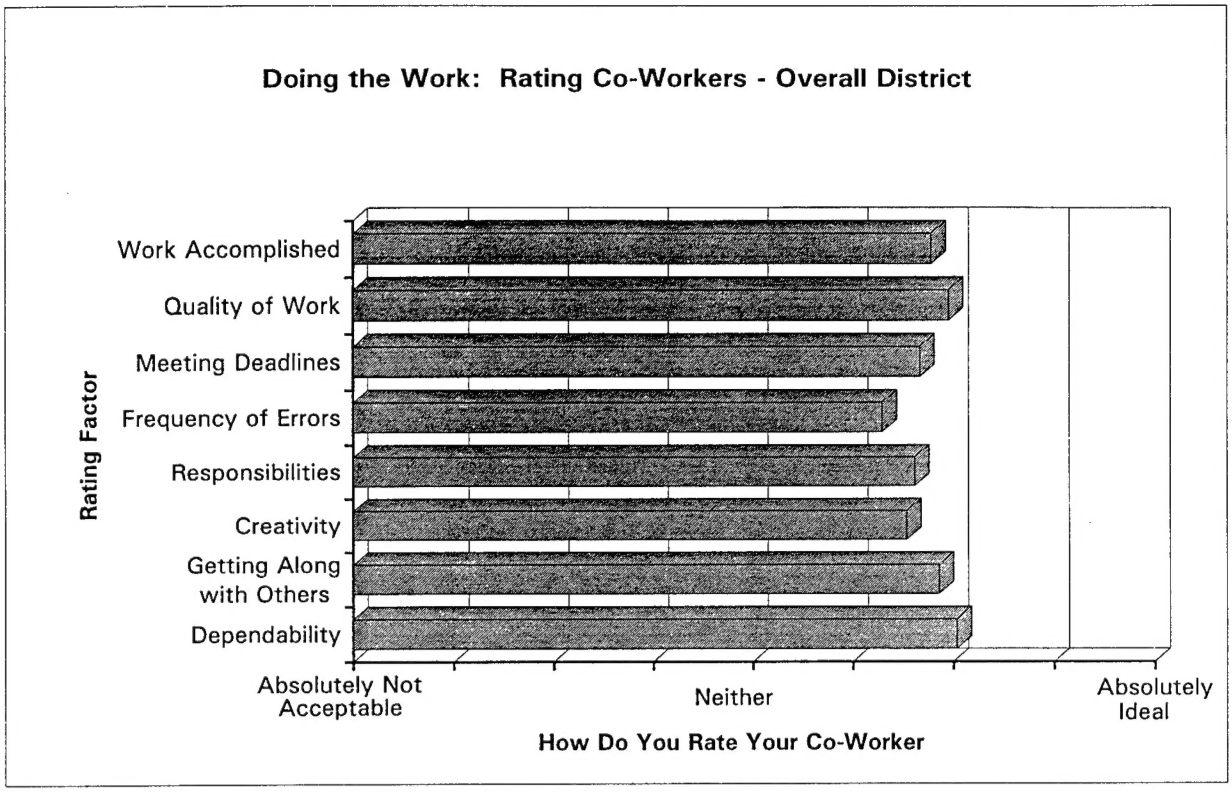

Chart 19: Doing the Work: Rating Co-Workers

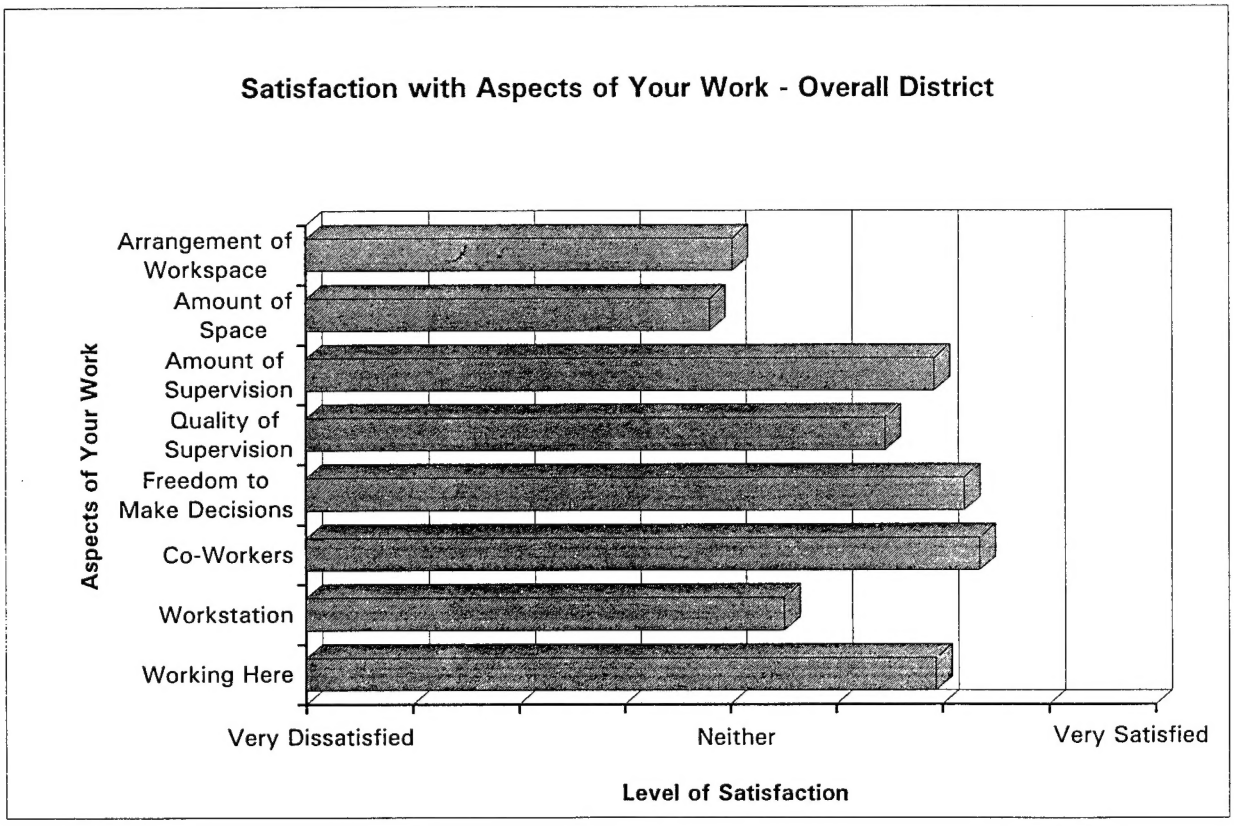

Chart 20: Satisfaction with Aspects of Your Work

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